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MANICARIA SACCIFERA AND ITS CULTURAL SIGNIFICANCE AMONG THE WARAO INDIANS OF VENEZUELA

BY

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Within the tropical and subtropical belt that circles the earth, palms can truly be counted among the best friends of man. In several regions, the various parts of the palm are so thoroughly exploited for purposes of food, drink, basic materials, tools, and utensils that it assumes a pivotal position in the cultural life of the people. In South America outstanding examples are *Astrocaryum*, *Euterpe*, *Guilielma*, *Jessenia*, *Mauritia*, *Maximiliana*, *Oenocarpus*, *Orbignya*, and *Syagrus*. In addition, the Indians are known to utilize the products of at least a dozen other genera of palms.[1]

This paper focuses on *Manicaria saccifera*, the *temiche* palm, and its cultural importance among the Warao Indians of Venezuela (PLATE LXVI). Ethnobotanical information on this genus, except for descriptions in floras, is slight, and the fact that *Manicaria saccifera* is used as a source of sago has, heretofore, gone unrecorded in the scientific literature.[2]

As an ancient food-quest activity of man, the recovery of palm starch "appears to be a pantropical phenomenon that is most highly developed on the mainland of Southeast Asia and in the West Pacific. In that region starch extraction involves, principally, palms of the genus *Metroxylon*, Sago Palms (Burkill 1935: 1460–1462; and Barrau 1959: 151–159). Palms

Plate LXVI

Manicaria saccifera in the forest of the Intermediate zone of the Orinoco Delta.

of other genera are also used to a lesser extent" (Heinen and Ruddle 1974: 116).[3]

In South America, the Indians recover starch from at least four genera of palms: *Syagrus*, *Copernicia*, *Mauritia*, and *Manicaria*, the most important being *Syagrus* and *Mauritia*.[4] *Syagrus Romanzoffianum* and *Copernicia cerifera* are exploited for sago by the Tupí-speaking Guayakí Indians of Paraguay and by several Guaranian and non-Guaranian tribes of the Gran Chaco. *Mauritia flexuosa* and *Manicaria saccifera* are utilized for sago recovery by the Warao Indians of the Orinoco Delta in Venezuela and in the adjacent easterly regions of Guyana.

Syagrus Romanzoffianum, the Paraguayan coconut or queen palm, has a southeasterly distribution in South America, where it is known by its Guaraní name *pindó*. The Guayakí call the palm *tói* (*töi*, *täi*) and refer to its sago as *krakú* (Cadogan 1960). Because of the many uses to which its different parts are put, *Syagrus Romanzoffianum* plays an outstanding role in the lives of the autochthonous and rural populations of this part of the New World. In fact, for the different Indian tribes of the area it represents probably the most important economic plant of their environment.

The extraction of sago from *Syagrus Romanzoffianum* and *Copernicia cerifera* is known to be practiced in South America by such tribes as the Guayakí, Mbyá (Cainguá), Kaingán, Toba, Lengua, and Chamacoco. But it is highly probable that this practice was diffused much more widely in earlier, pre-agricultural times. Writes Vellard (1934–35: 240–241) concerning the Guayakí:

> . . . it is the flour extracted from the pindo palm (*Cocos Romanzoffiana*) which, along with the game and honey, constitutes their basic diet. . . . To prepare the flour . . . the Guayakí cut open the trunk with an axe. The fibers are pounded and crushed on the spot with the help of an old piece of bow or with the back of the axe, then they are roughly strained on a square frame with loose straw or lamellas of bamboo bark. After being moistened with water the flour is used for making cakes which are eaten raw or dried near the fire.

Vellard (ibid., p. 240) points out that *krakú* starch is prepared not only by the Guayakí but also by the Mbyá, a subgroup of the Guaraní-speaking Cainguá. They fall back on it as an emergency food. "To obtain the starchy pith of palm trees, the Mbyá extracted the long fibers imbedded in starch from the lower part of the trunk. They either pounded them in a mortar and sucked them or else dried them on a platform in the sun or over the fire, pounded them, sifted them through a net, and then made them into loaves or cakes" (Métraux 1946a: 262). Even the Paraguayans resorted to eating *krakú* "after the disastrous war against the Triple-Alliance (1866–1870)" (Vellard ibid. p. 240).

For the Kaingán (Caingang), a non-Guaraní-speaking tribe of southern Brazil, the sago of *Syagrus Romanzoffianum* was an important food before it was replaced by manioc flour. (The Indians crushed the pith in a mortar and sifted the flour before roasting it in a pan, just as is done now with manioc flour.) (Métraux 1946*b*: 445–453.)

Métraux (1946*a*: 248, 261) also describes the Toba, the Lengua, and the Chamacoco tribes of the Gran Chaco as recovering the palm starch of *Copernicia cerifera*. The Toba pound the pith in a mortar and boil it as a mush, whereas the Lengua grate it into flour for cakes. *Carandaipe* starch is a principal vegetable food for the Chamacoco.

The best documented case by far of palm-starch extraction for any South American Indian tribe comes from the region of the Warao, where chroniclers, missionaries, travellers, and anthropologists have become aware of its existence and where, on numerous occasions over the past twenty years of intermittent field work, I witnessed at first hand the process of recovery of sago from *Mauritia*.[5] The ethnobotanical data available on this palm are too abundant to be treated here. Suffice it to say that *Mauritia* sago, *ohidu aru*, has been the staple food for most Warao until very recently, when it was supplanted by ocumo (*Xanthosoma sagittifolium*) and, to a lesser extent, by manioc (*Manihot esculenta*).

The practice of extracting sago from *Manicaria saccifera*

(*yahuhi aru*) came to my attention only recently, and I was able to witness the procedure for the first time in the summer of 1975.

In a process that may have taken more than a thousand years, the Warao have adapted their life and culture to the rather difficult outer world of the Orinoco Delta, situated in eastern Venezuela between 8° and 10° north latitude and between 59° and 62° west longitude. The Delta is a large fan of alluvial deposits occupying 17,000 square kilometers and bounded on the south by the Orinoco River proper and on the west by the Manamo which branches off the main river at Barrancas, where the apex of the Delta is situated. Most of this low-lying triangle is a tidal swamp lacking in dry ground and stone and extending inland from 50 to 100 kilometers (Liddle 1928: 20–24).

Manicaria does not grow throughout this vast area but is restricted mainly to regions immediately within the Intermediate Delta zone behind the Lower Delta, most of which is covered by a belt of mangrove. Typical of such environments, the soil is almost always inundated, thus providing along the perimeter of the swamp the ideal condition for the pioneering *Rhizophora Mangle*. The feature characteristic of mangrove forests of growing on the periphery while dying at the core is of primary importance to the Warao. The clearing that results from the decomposing inner parts of the mangrove forest is invaded by many kinds of trees important to the Indians, among them useful palms such as the *Mauritia*, *Euterpe*, and *Manicaria*. Thus, within and behind the coastal mangrove belt of the Lower and Intermediate Delta zones there developed the echonich of a palmetum that has amply served the Warao as an abundant food basket and as a secure home.

The average mean temperature of the Delta is 26° C, the humidity 60 to 80 percent. The rainy season lasts roughly from May to October and the dry season from November to April, but rainy days with more or less intensive showers occur throughout the year. The annual precipitation ranges

from 100 to 200 centimeters (Heinen and Lavandero 1973: 4–11).

Twice daily the tide washes over the palmetum, encouraging the growth of the trees. The annual flooding of the Orinoco is felt only indirectly in the Intermediate Delta; the flooding of the palm groves during the wet season is actually due to rainfall. In the dry season, when the waters of the Orinoco recede, sea water penetrates into the Intermediate Delta, salinates the rivers, and temporarily causes a potable water problem. Within the palmetum, *Manicaria* appears to seek out not only places under the influence of the tides but also those exposed to the northeasterly trade winds that sweep over the Delta almost incessantly.

Warao culture is particularly adapted to life in this palm-rich environment. For the pre-agricultural Warao, the sago primarily of *Mauritia* and secondarily of *Manicaria* provided the staple food as well as a superabundance of edible fruits during much of the year. The *Euterpe* (*E. edulis*), too, yielded fruit and an especially tasty and rich palmito. *Manicaria* milk and *Mauritia* (unfermented) wine helped solve any drinking water problem, and the fat grubs of the palm borer (*Ryncophorus palmetum*), collected in overwhelming quantities from fallen *Mauritia* and *Manicaria*, was an important added source of protein to their diet. That the palms are a blessing is clearly recognized by the Warao, and these plants permeate their entire culture: its technological, socio-economic, and religious systems. The Indians refer to *Mauritia* sago, especially in combination with fish, as the "true food" of man; *Manicaria*, to a lesser degree, falls into the same category. Sago was more than a vital source of human sustenance; it came to be elevated to a position of ritual significance which has helped the Warao to cope psychologically with the hardships imposed upon them by a refuge environment little amenable to human life and culture.

Other palms found in the Orinoco Delta, but mostly outside the palmetum of the Lower and Intermediate zones, are *Astrocaryum*, *Jessenia*, *Maximiliana*, *Socratea* and others.

The study of *Manicaria* began in 1791, when the German botanist Joseph Gaertner (1791: 468, Pl. 2) founded the genus on the basis of the spathe, spadix, rachilla, and flowers of the plant (PLATE LXVII). Apparently, its trunk, foliage, and fruit remained largely unknown to the scientific world until sixty-two years later, when Wallace (1853: Plates II and XXVI) furnished his illustration of this "unique and handsome palm" (PLATE LXVIII). Wallace and other field workers have added much information to the original description,[6] although the genus, its speciation and distribution remain relatively little understood even today.[7]

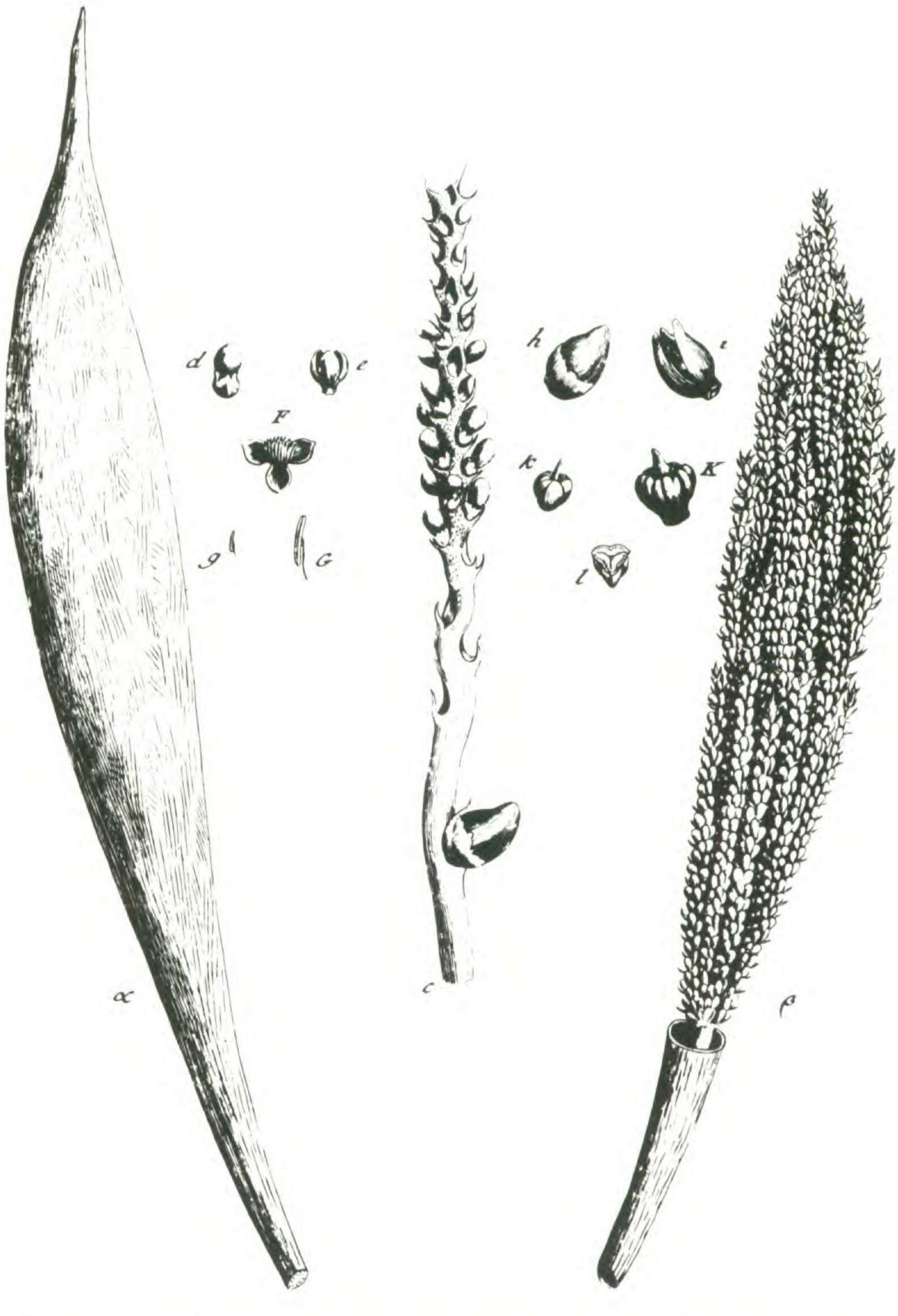
Standley and Steyermark (1958: 271) have published a concise summary of our present knowledge on the genus:

MANICARIA Gaertner

Reference: Burret, Notizbl. Bot. Gart. Berlin 11: 389. 1928.

Plants very robust, tall, or low, unarmed, the caudex stout, annulate, often curved or flexuous, covered with old leaf sheaths; leaves terminal, very large, suberect, lanceolate, acute, plicate-nerved, serrate at first and finally pinnatisect, the costa thick and stout, the petiole slender, the sheath cleft, its margins with many coarse fibers; spadices several, erect-spreading, tomentose, the branches strict, rather thick, foveolate; spathes 2, the upper fusiform, terete, mucronate, fibrous, tardily rupturing; bracts subulate; flowers monoecious, borne in the same spadix, this inserted among the leaves, simply branched, the flowers immersed in pits in the branches, the upper ones staminate, crowded, the lower ones scattered, pistillate; staminate flowers oblong trigonous, the sepals ovate-rounded, coriaceous, with scarious margins, imbricate, the petals thick-coriaceous, obovate-oblong, valvate; stamens 24–30, the filaments filiform, connate at the base, the anthers narrowly linear, erect, bifid at the base, emarginate; pistillate flowers larger, ovoid, the perianth little enlarged after anthesis, the sepals rounded, their margins finally lacerate, broadly imbricate, the petals longer, covolute-imbricate at the base, acute and valvate at the apex; ovary sulcate, 3-celled, the stigmas 3, sessile; fruit large, globose, 1-seeded, or depressed-globose and 2-3-seeded, the stigmas terminal, the pericarp corticate, the cortex corky, angulate-echinate, the endocarp vitreous-crustaceous, fibrous within;

Plate LXVII



Spathe, spadix, rachilla, and flowers that served Gaertner to establish the genus *Manicaria*, 1791.

Plate LXVIII

MANICARIA SACCIFERA Ht 40 Ft

First depiction by Wallace of *Manicaria*, 1853.

seeds globose, erect, the hilum oblong, the testa very hard, the branches of the raphe closely reticulate and involving the seed, the endosperm corneous, uniform, the embryo basal.

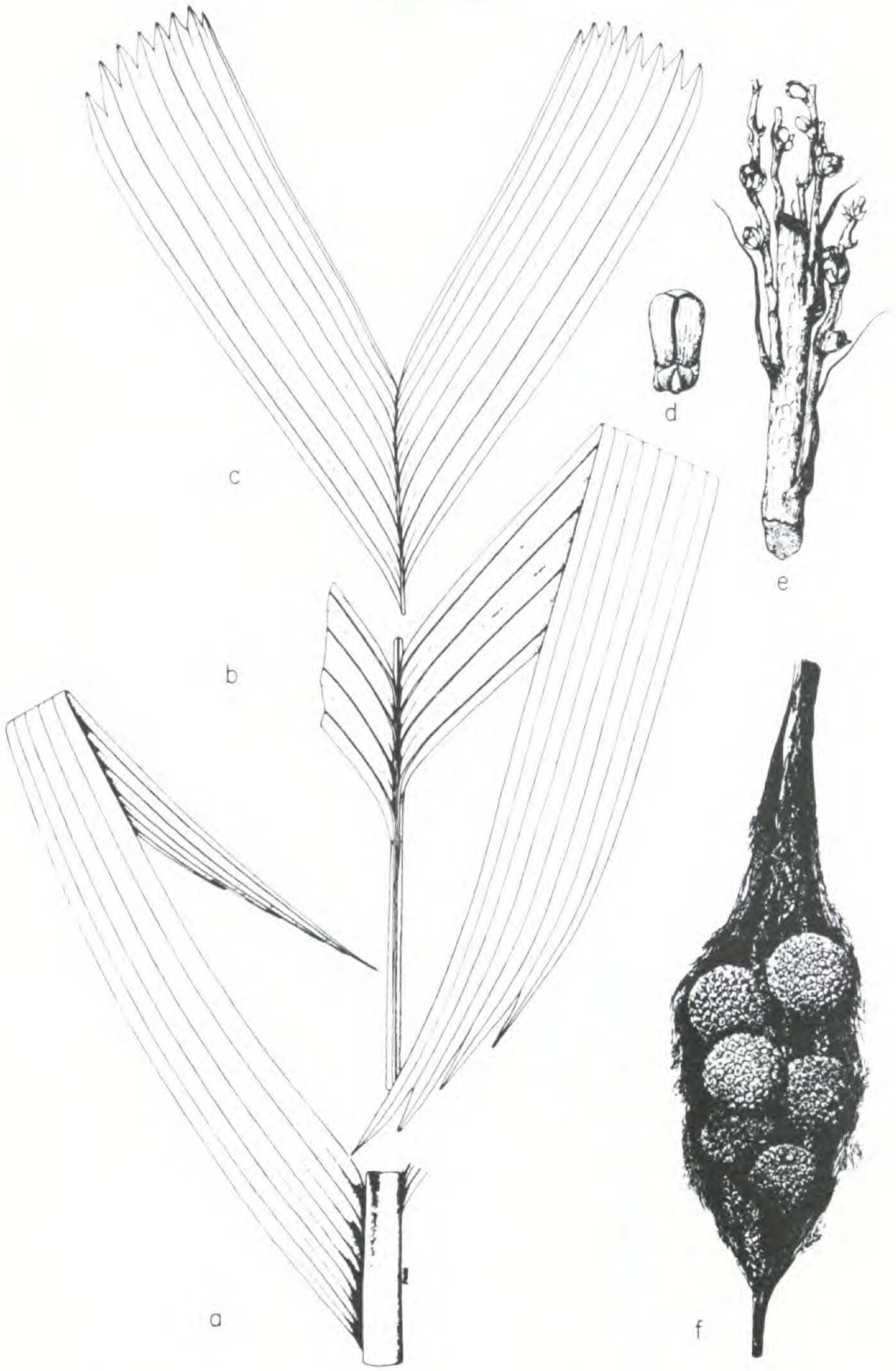
The genus has become known from Central America (Bailey 1943: 392–393; Standley and Steyermark 1958: 271–273), Trinidad (Bailey 1933: 409–413) and northern South America: from Colombia, the Orinoco Delta, the Guianas (Wessels Boer 1965*a*, *b*) to the mouth of the Amazon (Burret 1928: 389). It also occurs on the Rio Negro and the Upper Amazon (Wallace 1853: 70).

A very complete description of the species *Manicaria saccifera* was written by Wessels Boer (1965a: 21) PLATE LXIX:

Trunk solitary, up to 6 m. tall, about 3 dm. in diameter, in the upper part covered with dead leaf-bases, at base with prominent leaf-scars. About 10 contemporaneous suberect leaves; dead leaves persistent for some time and hanging down on the trunk; sheath with fibrous ventral part enclosing young leaves about 7 dm. long; petiole stout, about 12 dm. long and 8 cm. in diameter, grooved, leaf-blades very large, simple or irregularly pinnatisect through the action of the wind, also in leaves of juvenile plants, up to 7½ m. long and 23 dm. wide, bifid at apex, margin serrate; about 120 primary veins, 3–4 cm. distant at the middle of the blade, secondary veins inconspicuous; petiole, costa, and the lower surface of the blade at first more or less brown-tomentose, soon glabrescent.

Spadices almost erect, about 17 dm. long, with 2 spathes; outer spathe about 7 dm. long, flattened, invisible between leaf-sheaths, inner spathe about 11 dm. long, fusiform, mucronate, consisting of densely interwoven fibers without any suture, enclosing the inflorescence completely till long after anthesis; peduncle about 10 dm. long, rachis about 6 dm. long with up to 45 simple rachillas or rarely a few rachillas bifurcate, several large bracts along the peduncle within the inner spathe, smaller bracts at the base of the rachillas. Male flowers densely crowded in the upper part of the rachillas (and 2 laterally adjacent to each female flower), sunken in small pits and subtended by bracts 7–12 mm. long; sepals ovate, imbricate, 3–4 mm. long, petals lanceolate, valvate, ligneous-incrassate, 6–7 mm. long; stamens many (20–34), densely congested, filaments about 1½ mm. long, anthers 3 mm. long, the central ones usually misshapen. Female flowers few,

Plate LXIX



Depiction in Standley and Steyermark (1958: Fig. 45) of details of leaf, flower, and spathe of *Manicaria saccifera*.

(*Courtesy* Chicago Natural History Museum)

near the base of the rachillas between 2 male flowers, subtended by bracts; sepals ovate, imbricate, 7 mm. long, 8 mm. wide, petals ovate, valvate, acute at apex, ligneous-incrassate, 10 mm. long, 6 mm. wide; pistil globose, 4 mm. in diameter, stigma 3-fid, sessile, erect, 3–4 mm. long, strongly papillose. Fruit depressed-globose, 3-seeded or by abortion 1- or 2-seeded; exocarp corky, angulate-echinate, tubercles rather hard and not easily rubbed off; seed globose, about 4 cm. in diameter; embryo basal . . .

In this account of the genus, the most recent, Wessels Boer goes on to identify four species of *Manicaria*, very conspicuous and abundant swamp plants. The *Manicaria* occur in forests interspersed with other trees but also form colonies, or *temichales*, of great density. *Manicaria saccifera* is known in Venezuela as *temiche* (*timiche*, *timití*), an Arawakan noun; in Guyana as *truli*, a Cariban term; and in Brazil as *ubussú*, a Tupian word meaning "big leaves" (Civrieux 1957: 195–232). The Warao refer to it poetically as *yahuhi* (*yawihi*) meaning "plumes of the sun," descriptive of the leaves that look like giant bird feathers.

The Origin Myth of the Temiche Palm

Long ago there was an old woman who followed her husband to live in the lowlands of the Delta. Life was easier for the old couple there than where they had come from, and they greatly enjoyed the cool water of the bogland and the sea breeze that incessantly fanned their new home. The name of the old woman was Yahuhi.

As time went by, the woman felt a strange transformation taking place all over her body. First her eyes began to clear up so that she could see well again. Then the wrinkles in her face disappeared, her body firmed up like that of a girl, and her complexion became healthy and youthful looking. Even the voice of the old woman changed back to that of a maiden, and she began to sing with happiness over her regained youth.

The husband of the woman was equally taken by surprise

and wondered what the cause of this miraculous transformation might have been.

"I have changed because my body was exposed to the cool northwind," said the woman. "Let's remain here forever."

One day, the man told his youthful wife that he had to leave the house for a short while. He wanted to go to the field and do some gardening.

"Fine," said the woman. "I shall cook dinner and wait for you. But don't be later than you said."

Time passed, and the man failed to return within the set period of time. While his wife was waiting, she suddenly saw a handsome young man approaching the house from the North. He greeted her kindly and wanted to know where her husband had gone. "He has gone to the field and is overdue."

So then the visitor took advantage of the man's absence and seduced the youthful woman.

When the husband finally got home, the suitor had long since left the house, but the husband noticed that something was wrong. Questioning his wife, she finally confessed that a young man had visited and embraced her during his absence. It was his fault, she said. He had left her alone for so long.

This made the old man very angry. He prepared a rope and whipped the poor woman so mercilessly that marks began covering her body from head to foot. Days went by, and the woman became very ill. Because of the pain, she could neither sleep nor eat and, finally, she died.

Since there were no people living in the neighborhood who might have helped the old man bury his wife, the husband tied the corpse to a pole in an upright position. It looked as if the woman was just standing there, alive. And even after a full moon had passed, the woman's body still looked youthful and uncorrupted.

After that, however, the dead woman began to change into a tree. The husband left her, and upon looking back a final

time, saw that his wife had become a *temiche* palm. He said to himself: "Once the Warao will come to be on this earth, they will have to call this palm yawuhi, because that was her name as a woman."

The etiological intent of this simple narrative is clear: a prolific palm bearing fruit practically continuously is identified with a fertile young woman. Her fertility is miraculously caused by the wind of the north, whence also her youthful lover puts in an appearance.

For a Warao listener, the introduction of the northwind heralds doom. While the cool *nortes* in the Delta are certainly invigorating winds, they also bring catarrh and other respiratory ailments to the Warao. Furthermore, they blow from the direction where Haburi, the culture hero, lives in a world mountain-tree. As a youth, he had unwittingly seduced his own mother. The association of Haburi with the woman's paramour from the north is most certainly not lost on a Warao listener. In addition, Haburi himself had been made miraculously youthful and mature through the agent of an old frog-woman, who wanted him for a lover. Both the youthful *temiche* woman and Haburi were placed into a fateful triangle by virtue of their newly acquired sexual prowess. Adultery and incest were the inevitable consequences, since the partners of both the *temiche*-maiden and Haburi were infertile and no match. Consequently, the woman transformed into a palm as did Haburi into a world tree.

This sacrifice of metamorphosis results in enormous benefits for mankind: from the transformed woman, the ever producing *temiche* palm; and from the transformed hero, the dugout canoe, a *sine qua non* of human life in the Delta. So while the Warao listener can predict the tragedy that will inevitably result from the action of the *dramatis personae*, he can also anticipate the great benefits that will accrue to him from this primordial drama of the *temiche*-maiden, the old husband, and her paramour from the North.

The myth also explains why the *temiche* favors coastal

swamps with their tidewaters and sea breeze. Besides explaining the remarkable fertility of the palm, subject not to an annual flowering and fruiting season but to continuous yield and the swamp habitat of the *temiche*, the myth also offers an explanation for the exceptionally prominent leaf scars (*ya esoara*) that cover the entire stem of the palm. Similar explanations are given in Warao mythology for the rings of *Euterpe* and of trees like *Calophyllum*. Finally, as we shall see, different parts of the palm are used as medicine against respiratory illnesses. This blissful property of the plant may possibly find its explanation in the love of the tree-maiden for the *nortes* that commonly cause such ills.

Utilization of the Palm

The leaves. It is well to commence the discussion of the cultural significance of *Manicaria* for the Warao Indians with the plant's most outstanding characteristic, its leaves. The "plumes of the sun," *yahuhi*, as the Warao call them, are the largest entire leaf among palms and the largest in the plant kingdom. The palm studied for purposes of this paper had seventeen contemporaneous sub-erect leaves with two persistent dead leaves hanging down. The informant happened to know that the palm was between 30 and 35 years old. Along their entire axis, large leaves of the *Manicaria saccifera* measured 5–8 m. long and 1.5–1.8 m. wide, with petioles measuring 1.20–2 m. Braun (1968: 111) reports leaves 9 m. in length, and leaves of 10 m. are frequently mentioned in the literature. Through exposure to wind, the blades of large outer leaves tend to become irregularly pinnatisect, but younger inner blades remain undivided.

It is precisely this latter quality coupled with their size that make *Manicaria* leaves especially suited for house thatch wherever the plant grows (PLATE LXX). As Im Thurn (1967 [1883]: 209) observed, "each gigantic undivided leaf of the troolie palm (*Manicaria saccifera*) is really a shelter in itself; and a few of these laid, without further preparation,

Plate LXX

Warao houses with *Manicaria* thatch. *Mauritia flexuosa* in the background. (*Courtesy* P. T. Furst)

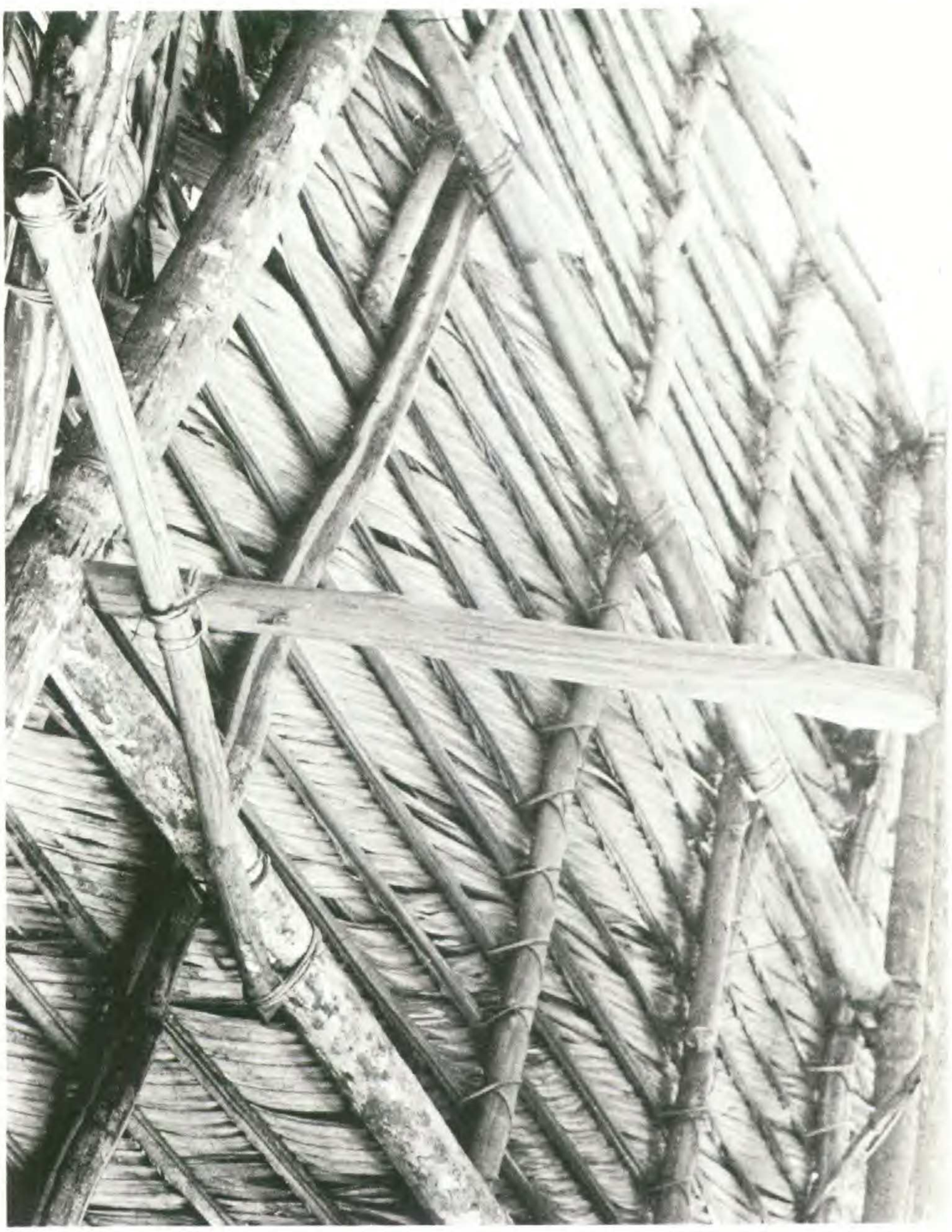
so as to overlap like tiles, make a most perfect roof. Indeed, before corrugated zinc was introduced for the purpose, a large trade was carried on between the Indians and the planters on the coast in these troolie-leaves, with which most of the buildings on the sugar estates were thatched."

For weather protection, the Warao implant single leaves or a whole line of them into the soft ground near their working areas. They also cover their heads with leaf segments when traveling on foot or by boat, calling these makeshift umbrellas *aroko a kuasimara*, leaf capes.

To thatch their houses, the Indians fold the leaves in half along the rachis and lash them in overlapping fashion, each rib 25 cm. from the next, vertically onto the infra-structure of the roof, "so that each frond forms a long tile reaching from ridge to eaves" (Spruce 1908, 1: 59) (PLATE LXXI). The house of my main informant had been covered in this way in 1969 and did not begin to leak until 1975, testimony of the durability of *temiche* thatch. To keep the rain from drifting in with the sea breeze, the Warao install a screen of *temiche* (*dara yawihi*) on the windward side of their otherwise wall-less houses[8] (PLATE LXXII). Sometimes they construct a tunnel-like roof over the midsection of their dugout canoes to protect themselves from the weather during long journeys.

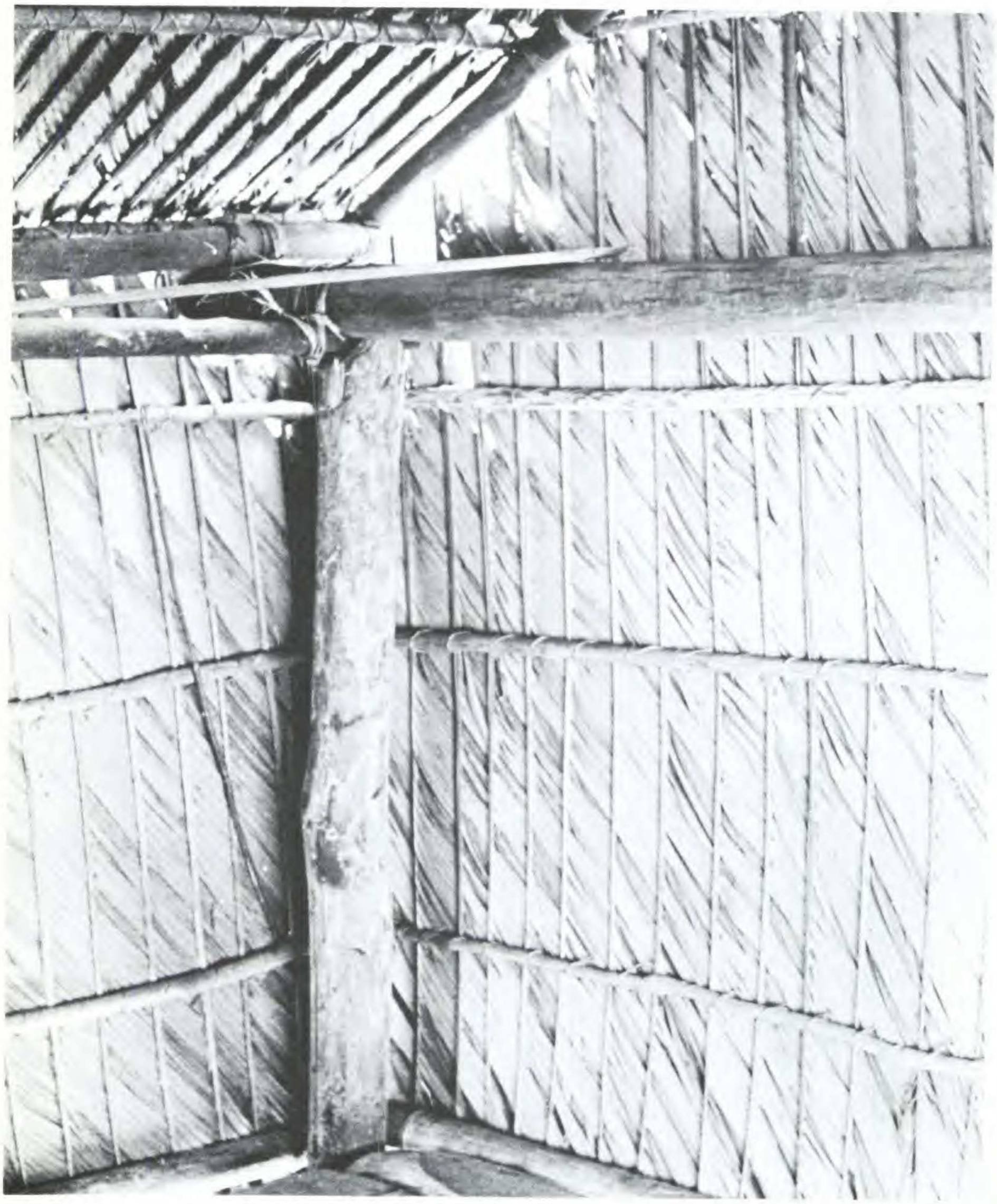
An ingenious naval invention is making sails (*yawihi wera*) from large *Manicaria* leaves. On the open windswept *caños* of the Delta, Warao canoes go by at high speed under full sail. Two or three crew members each hold up a *Manicaria* leaf for sails, bracing it at the bottom against the foot and holding it with one arm (PLATE LXXIII). A helmsman keeps the course by means of a paddle held vertically as a rudder. I have clocked canoes 6 m. long with two paddlers but no sails going 3 kph, their full speed. Canoes with *temiche* "sails" go that fast, or faster, and, of course, for a longer period of time. Consequently, in terms of primitive navigation, the *yawihi wera* of the Warao represents critical navigational tackle. Despite its Spanish-derived

Plate LXXI



Detail of roofing of a Warao house. (*Courtesy* P. T. Furst)

Plate LXXII



Detail of weather screen on the windward side of a Warao house.
(*Courtesy* P. T. Furst)

Three canoes with some fourteen passengers and a heavy load of fire wood are being propelled by holding up three leaves of *Manicaria saccifera*. Warao Indians of the Intermediate zone of the Orinoco

(*Courtesy* P. T. FURST)

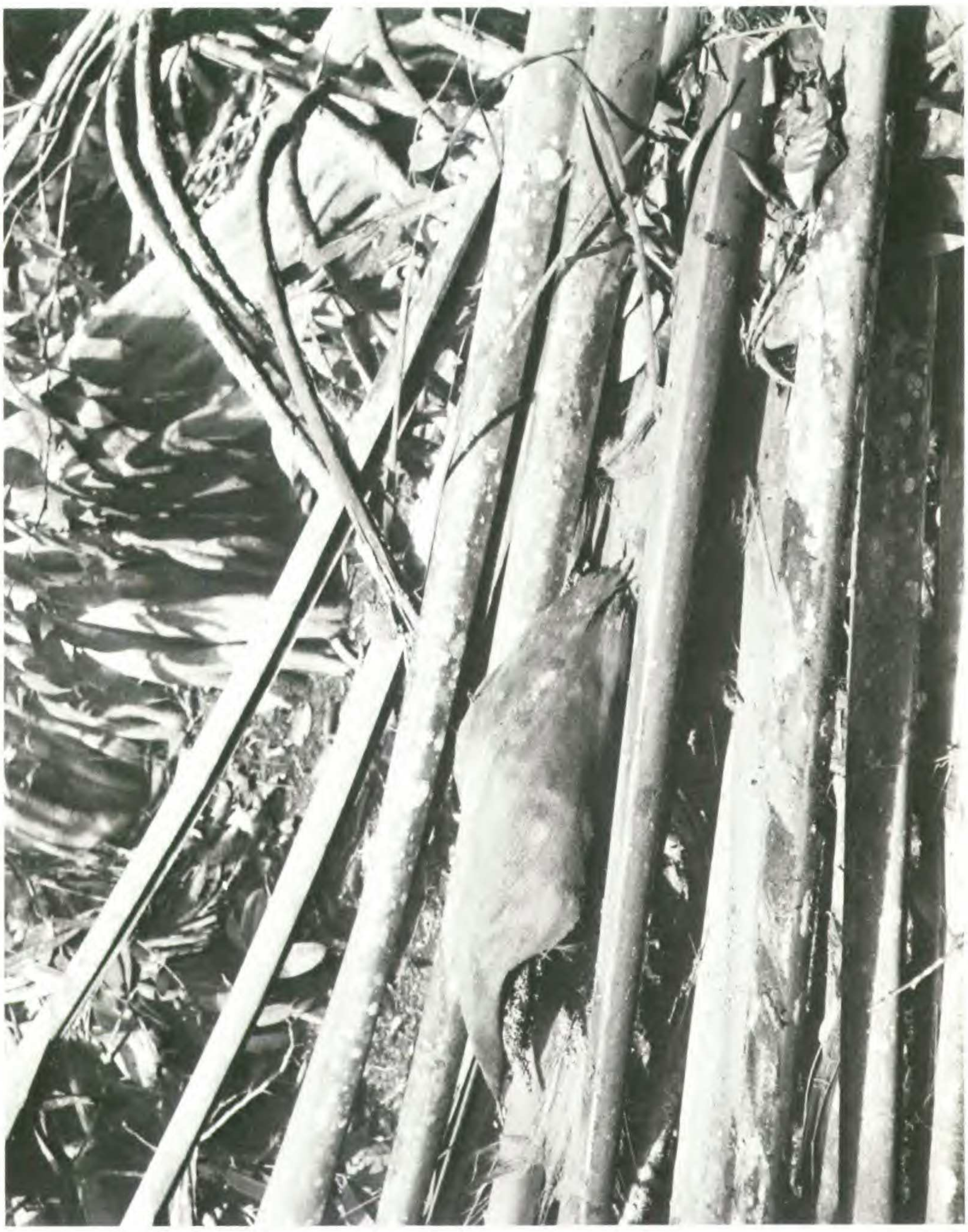
name (*wera*=*vela*, sail), I wonder whether, in view of its simplicity, sailing by *yawihi wera* does not antedate the arrival of the white man in northeastern South America. Since *Manicaria* is ubiquitous in the Lower and Intermediate Delta zones, a "sail" can be picked up at practically any point of departure and simply tossed away upon arrival at the destination. In other words, *Manicaria* leaf-sails are handy, free, and uncomplicated.

Manicaria leaves, or certain parts, are put to other uses by the Warao Indians. The tips of the leaves are improvised for use as fans (*yami*); several, 2 m. long pieces of rachises of leaves are tied together in the form of a Venetian blind to serve as fish weirs (*noba*); sections of midrib are rubbed together to produce fire by rotation (Im Thurn 1967: 257). The "plumes of the sun" represent a *materia prima* of great importance to Warao technology.

A final comment on the etymology of the Warao term "plumes of the sun." It is derived from far more than the shape of leaves that flicker in the sun (as some authors seem to suggest). The *Manicaria* leaves obviously resemble over-sized bird feathers; but why they are linked to the sun is less evident. *Manicaria*, like many other palms, are closely connected with a symbolism of light and darkness, day and night, and I discuss this aspect below.

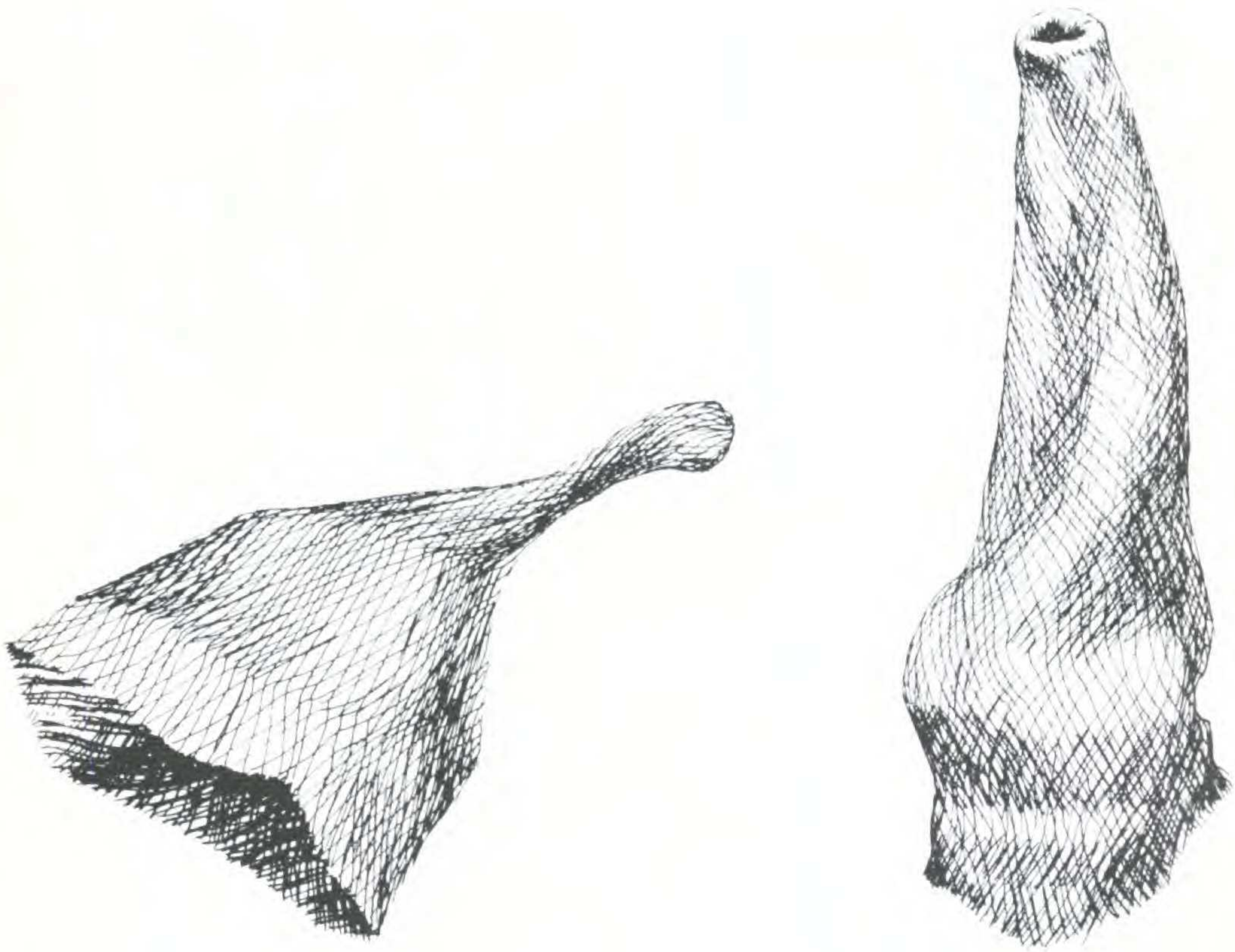
The spathe. Next in importance are the pouch-like spathes that cover the entire inflorescence and the large pendant infructescence (PLATE LXXIV). The brown spathes from which the genus and the species derive their names [9] are from 40 to 60 cm. long, "of fine, closely woven texture, and are used by the natives to make soft brown caps without seams or joinings" (McCurrah 1960: 129). The Warao refer to these hood-like caps as *yasi nona*. After carefully peeling the spathe off the fruit cluster, the Indians wet and stretch it on the head to give it the desired fit (Appun 1871: 479; Wilbert 1963: 9). By pleating them and decorating them with bast ribbons the long-peaked caps sometimes acquire a bizarre appearance (PLATES LXXV–LXXVII). They are

Plate LXXIV



Spathe

Plate LXXV



Hats made from spathe of *Manicaria saccifera*.
Drawn by Helga Adibi

Plate LXXVI

Warao Indian with hat made from spathe of *Manicaria saccifera.*
(*Courtesy* P. T. Furst)

Warao Indian (on the left) with hat made from spathe of *Manicaria saccifera*.
(*Courtesy* P. T. Furst)

worn in many shapes and forms by natives, Creoles, and tourists in Mesoamerica (Standley and Steyermark 1958: 273) and in Brazil (Wallace 1853: 70). I have not seen them used by the Warao as bags and wrapping cloth (ibid.) or as loin cloths (Braun 1968: 111).

The fruit. The fruits (*yawihi aukwaha*) serve the Warao as food and drink. One specimen of infructescence that I examined weighed 12 kg; the clear liquid inside the nuts accounted for approximately one-third, i.e., 3.75 liters (PLATE LXXVIII). The entire bunch was 87.5 cm. long and 25 cm. wide and was composed of 67 fruits: 22 one-seeded, 25 two-seeded, and 20 three-seeded ones.[10] The single fruits measured between 7 and 8 cm. in diameter, twins and triplets 9.5 cm. All a Warao needs do to satisfy his thirst, whether in the jungle, along the coast, or in the field, is to cut just one bunch of *temiche* fruit and drink his fill. In times of non-potable water, the Indians take along a load of fruit clusters in their dugouts (Turrado Moreno 1945: 92). To get at the water, the Indian bites into the corky exocarp (*nakoro ahoro*) or cuts a hole in it and drinks the water from a calabash or from its natural cup. The fleshy homogeneous endosperm of the as yet immature fruit (*nohi*) is greatly relished by the Indians; the fruit is opened with a blow of a heavy stick and the jelly-like substance scraped out with the thumbnail. Fully matured fruits, which resemble miniature coconuts (*ya umo*) fall to the ground. They get buried in the detritus or are washed out to the rivers and the sea. In this state, they are hard and inedible, but find use as whorls in the manufacture of toy tops for boys (PLATE LXXIX).

The seedlings. Seedlings (*emukohoko*) are sought after by the Indians, young and old. If the germination results obtained by Braun (1968: 54) for cultivated *Manicaria saccifera* are any indication, the seeds of this palm germinate in four months, more or less. The Indians search for seedlings that are developed enough to have grown their characteristic bifid eophylls up to 30 cm. above the ground.[11] They pull

Plate LXXVIII

Fruiting spathe and infructescence.

Photograph by Johannes Wilbert

Plate LXXIX

Top made of *Manicaria* seed. *Drawn by* Helga Adibi

them out and crack the hard shell of the seed with a heavy stick, exposing the white spongy haustorium. It has a mildly sweet taste, and as many as twenty at a time can be consumed without fear of digestive complications. Only children who eat primarily a diet of ocumo and fish are said to suffer occasionally from diarrhea.

Ethnomedicine. Several parts are believed to have medicinal properties and are used as remedies against catarrh: that is, cough and fever; and against symptoms of other respiratory problems. An Indian woman prepared some medicines in my presence, so that I can verify the following recipes – if not attest to their effectiveness.

To alleviate coughing and to repress fever, the water of *Manicaria* fruit is carefully strained through a cloth to eliminate impurities. The patient drinks a cup three times a day.

Fever and cough are alleviated with a potion made of the green juices from the fresh eophylls of *Mauritia* mixed with *Manicaria* water. Added to the slimy chlorophyllous liquid is the urine of a child of opposite sex of the patient. The preparation is set aside for forty-eight hours and then applied to the patient's body, especially his temples and forehead. The treatment is repeated three times a day. I found the remedy to have a definite cooling, hence soothing effect. Small children are washed in the liquid from head to foot to stop diarrhea accompanied by fever. Occasionally, they are also given a small quantity to imbibe.

The anti-asthmatic and anti-catarrhal effect of the liquid endosperm of *Manicaria* has been mentioned by previous investigators. Since asthma does not seem to afflict the Warao, I could not verify this assertion, although all informants assured me that the fruit water of the palm facilitates breathing in congested patients. Most effective in this respect is a concoction made of grated *Manicaria* palmito mixed with fruit water. The remedy is imbibed.

Indirect benefits. An indirect benefit accruing to the Indians from *Manicaria* relates to the fact that the ripe,

fallen fruit attract certain mammals like deer, peccary, paca, monkey, and agouti; turkey birds, like the *paují*, are also fond of them. Traditionally, however, the Warao avoid the large species of mammal, like deer and peccary, and refrain from eating monkey altogether; but they like agouti, paca, and *paují*. The agouti and the paca are ambushed at sunrise by the hunter who hides in the vicinity of the palm. The birds are best shot in the early afternoon hours, when they give themselves away by the crashing noises that they produce moving around among the leaves of the plant.

I have mentioned the important protein supplement to the diet of these Indians provided by the rich supply of fatty larvae that are laid in *Mauritia* and in *Manicaria* by the palm borer.

Recovery of sago. In the summer of 1974, while collecting data on Warao ethnomedicine in the forests of the Orinoco Delta, one of my informants volunteered that, in addition to providing the Indians with a remedy against fever, catarrh, and diarrhea, *Manicaria* also produced a starch similar to that from the *Mauritia*. He added that the extraction of *temiche* sago had fallen out of practice, but that it had formerly been common. Realizing that when a Warao speaks of palm starch he knows what he is talking about, I asked him to produce some *temiche* starch for me when I returned the following summer. What follows is a report on the process of sago recovery from *Manicaria saccifera* as witnessed by me in August 1975. PLATES LXXX–XCVIII illustrate the process.

Throughout an area of dense pluvial forest scattered individuals of *Manicaria* grew at distances from each other of 4 to 6 m. Their trunks (*akabaho*) were mostly erect and of varying heights, from 2 m. to 8 m. They were dark brown with very prominent circular leaf scars 2 to 3 cm. thick. Most of the palms seemed to be growing on small mounds 30 to 50 cm. high, but their roots (*ya ahokonamu*) were not exposed, or only minimally so.

After felling the palm, the Indian established how far

Plate LXXX

Felling the *Manicaria saccifera*. *Photograph by* Johannes Wilbert

Plate LXXXI

Removing the bark for sago extraction.
Photograph by Johannes Wilbert

Making a trough from a section of *Mauritia flexuosa*.
Photograph by JOHANNES WILBERT

down from the crown it contained sago. The testing was done by driving an axe into the trunk at various intervals. When the axe was withdrawn, with starch sticking to its blade, it signified contact with starchy pith.

According to the Warao, *Manicaria*, unlike *Mauritia*, has no annual flowering and fruiting period and contains starch the year round. The specimen used for the experiment contained sago in the upper 3 m. of the 6 m. long and 30 cm. thick trunk. To obtain for me a unit measurement of the volume of sago in one palm, the Indian removed with his axe the bark of a 1 m. long section below the crown, exposing in the opening a beige to light brown fibrous interior, not pithy like *Mauritia* but somewhat ligneous.

The Indian then stood on top of the trunk and shredded the pith with an adze or hoe (*nahuru*).[12] The hoe is a composite tool which the Warao claim to have adopted, in remote times, from cannibalistic neighbors, called Siawani. It consists of three basic parts – blade, handle, and binding. The blade (*nahuru ateho*) is carved from the bark of a mature *Mauritia* and is 3 cm. thick. Its length varies between 40 and 60 cm. according to the height of its user. The working end (*ahi*) of the wooden blade is about 15 cm. wide and grooved to form a double cutting edge. Laterally, the blade is carved concavely and provided with notched shoulders (*arokuaha*) near the end opposite the cutting edge to facilitate securing the blade to the cleft end of the handle.

The handle (*aka*) is a round piece of wood 3 cm. thick. Any hard wood will do, and the length of the handle is roughly equal to the length of the blade. A cleft is made in one end, into which the non-cutting end of the blade is firmly wedged; the junction is lashed together with two-ply cordage made of *Mauritia* bast. A second string of this kind (*ahutu*) connects the blade with the handle like the crossbar of the letter A. To prevent this binding from slipping, two notches (*iwiri*) are made on the sides of the blade about 20 cm. below the cutting edge (PLATES LXXXIV–LXXXVI).

The Indian had made a new hoe the day before. As it

Plate LXXXIII

V-shaped trough made from a section of the trunk of *Mauritia flexuosa*.
Photograph by Johannes Wilbert

Plate LXXXIV

Using a hoe to crush the starch. *Photograph by* Johannes Wilbert

Plate LXXXV

The opened *Manicaria saccifera* is lying on top of leaves to prevent the shredded pith from falling on the swampy soil. Close-up of the hoe used in the process of crushing the pith.

Photograph by Johannes Wilbert

turned out, inexperience with extracting sago from *Manicaria* prompted him to make a cutting edge as wide as that used for extracting starch from *Mauritia*, which has a much larger trunk. The space between the hard bark on either side of the opening measured only 26 cm., much less than the trunk of a *Mauritia* customarily utilized for starch recovery. Thus, the edge proved to be too wide to be efficiently used. The Warao hoe bears close resemblance to sago hoes used in southeast New Guinea for the same purpose (Stöhr, 1972, Fig. 35).

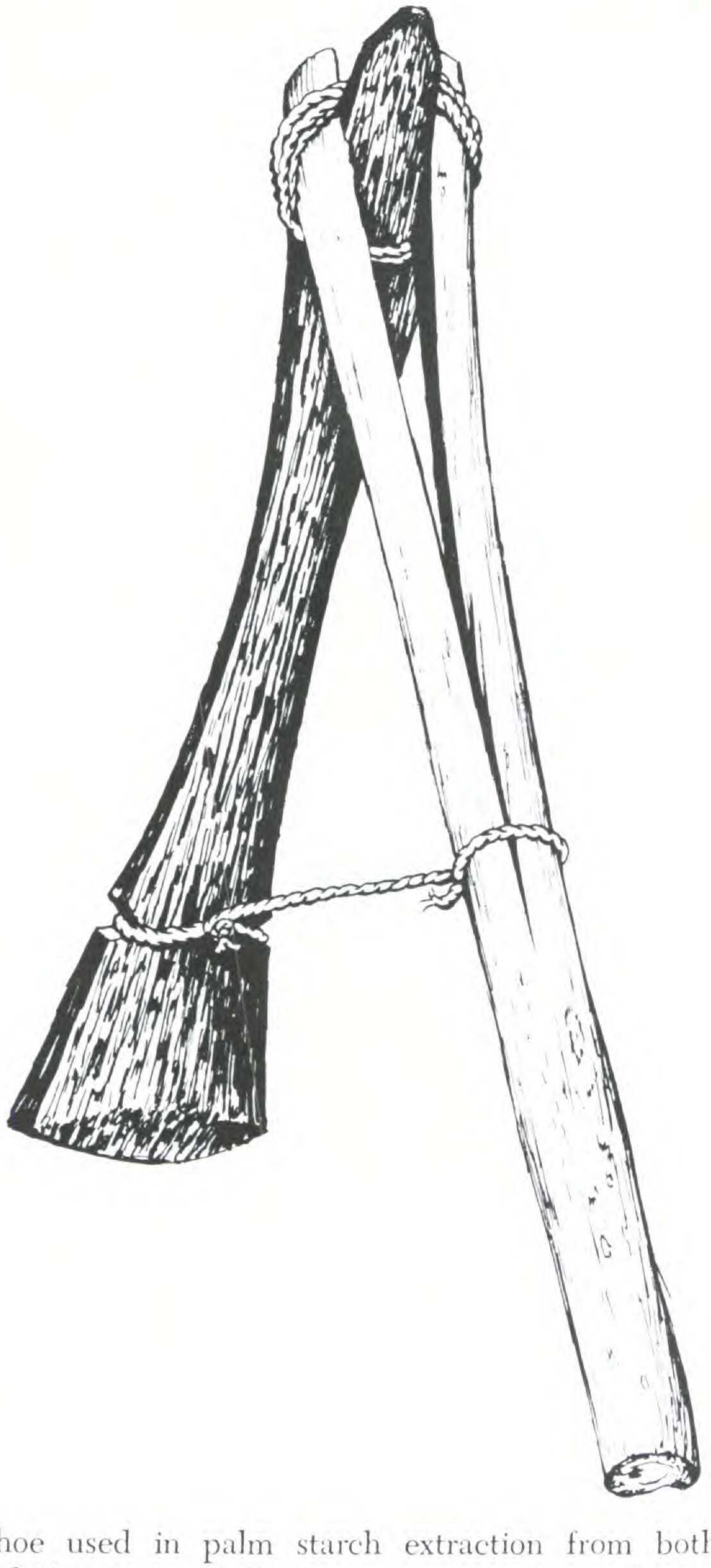
After the pith was crushed, a woman washed it in a trough made from a piece of the trunk of a *Mauritia* 1.25 m. long. About 25 cm. at either end of the trough (*canoa arua*) was left untouched and the centre section excavated by means of an axe, so that a cross section was V-shaped (PLATE LXXXIII).

After the men had placed the trough in a north/south direction (it must never be in the direction of the course of the sun), the woman drove four 1.20 m. long petiole sections of *Mauritia* (*namoru*) halfway into the water-logged ground next to the hollowed-out *Manicaria* (PLATE LXXXVIII). Two uprights 75cm. apart stood on either side of the trough, and on top of these uprights the woman placed a dish-like strainer (*bihi*) made of strips of *Ischnosiphon*. Immediately below the strainer she positioned, at a steep angle, the fleshy end of a *Mauritia* leaf stem (*wate buaka*) for the purpose of collecting the washed pith below the strainer and channeling it smoothly into the trough without splashing.

The woman collected the crushed pith from the trough, transferred it onto the strainer by means of a calabash (*Cresentia Cujete*), poured water over the pith, and began kneading it. From time to time, she scooped out some water from the trough and poured it over her hands and the pith. The water turned milky in the process, and the sago began settling on the bottom of the trough (PLATES LXXXIX–XCIII).

The moment the woman started kneading the pith, she

Plate LXXXVI



Warao hoe used in palm starch extraction from both *Mauritia flexuosa and Manicaria saccifera.* *Drawn by* Helga Adibi

Trough with sieve resting on four uprights ready for the washing of *Manicaria saccifera* pith extracted from the palm in the foreground of the picture. Notice fleshy end of a *Mauritia* leaf stem below the strainer to channel the water into the trough without splashing.

Photograph by JOHANNES WILBERT

Trough filled with starch containing water after the woman finished washing the pith.

Photogrph by JOHANNES WILBERT

Plate LXXXIX

Woman collecting shredded *Manicaria saccifera* pith into her calabash.
Photograph by Johannes Wilbert

Plate XC

Calabash filled with shredded *Manicaria saccifera* pith resting on palm from which it has been extracted.

Photograph by Johannes Wilbert

observed to me that it was rich in sago which, she said, one is able to determine by the viscid quality of the pith (PLATE XCIV). She observed, too, that it felt exactly like processing sago-rich *Mauritia* pith, except that she had to exert more pressure kneading the pith of *Manicaria*, because it was more ligneous than the other. Another difference between processing the two starches was that she had to wait longer for the *Manicaria* starch to settle at the bottom of the trough. She said that the resulting meal was of a lighter quality. After waiting for ten minutes in the shade of a windscreen (made of two *temiche* leaves stuck in the ground), the woman began to drain the water carefully by ladling it out of the trough with her calabash (PLATE XCV). She then shaped the meal into a ball of light brown sago and, in doing so, proved conclusively that *Manicaria saccifera* must be counted among the sago-producing genera of the palms (PLATE XCVI).

The total process of crushing, washing, and collecting the sago took approximately thirty working minutes.

Upon completion of her work, the woman painstakingly washed her strainer to remove all particles from between the basketry strands (PLATE XCVII). This act would prevent the strainer from rotting. Next, she pulled the four uprights out of the ground and tossed them to the side (PLATE XCVIII). This would prevent malignant shamans from blowing on them, causing her arms to hurt. Finally, the man picked up the heavy trough and carried it a short distance away. This would make it more difficult for youngsters to poke inside with their machetes. People after mischief might do this to afflict the sago washer with ailing arms and shoulders.

From the opening in the trunk, which was 1 m. long, the woman collected two calabashes packed to the brim with pith. The calabash used was 25 cm. long, 17.5 cm. wide, and 12 cm. deep. From that much pith, the woman washed out 750 gr. of sago. It had been ascertained that the trunk of the felled *Manicaria* contained starch within 3 m. of its upper

half, the total sago yield from that plant would amount to 2.250 kg. I suggest adding at least another 750 gr. to account for the fact that the wide blade of the hoe prevented the Indian from extracting all of the available pith. A close approximation of the potential yield of the tested *Manicaria* is 3 kg. Even at that, *Manicaria* must be considered a low yield sago palm for the purpose to which the Warao put it: emergency food.[13]

In order to assess the nutritional value of *Manicaria* starch, I had the procured sample analyzed at laboratories in Caracas. The results of these tests are summarized in Table I.

TABLE I
Composition of *Manicaria saccifera* Starch

pH (sol. 2%)	5.75	
Humidity	63.51%	63.51%
Fat *	0.55%	
Dextrose *	5.07%	
Protein *	1.62%	
Starch *	4.57%	
Fiber **	24.68%	
	36.49%	36.49%
		100.00%

* Calculation based on dry material
** By balance

Ethnobotanical lore. The process of producing starch from *Mauritia* is a highly ritualized affair when done in preparation for the annual harvest festival *nahanamu* or in connection with any other propitiatory offering. The implements used in *Manicaria* starch extraction are also subject to certain taboos, but, for several reasons, *Manicaria* sago is considered less appropriate for these sacrificial purposes than the other.

In the first place, the production yield of *Mauritia* is far greater (Heinen and Ruddle 1974). For instance, the amount of sago needed for a well prepared *nahanamu* festival varies

Transporting a calabash full of shredded *Maniacaria saccifera* pith to the washing stand. *Photograph by* JOHANNES WILBERT

Woman pours the *Manicaria saccifera* pith onto the sieve.
Photograph by JOHANNES WILBERT

from 500 to 1,500 kg., allowing from 2 kg. to 4 kg. per participant. Families are engaged from six to ten weeks in its production. To produce this amount of sago from *Manicaria* would be almost impossible in terms of time and labor. The Warao insist, however, that *Manicaria* sago is acceptable to the Supernaturals and that it can be offered to them in propitiation.

A decisive factor in making palm starch acceptable to the gods is that, in its fresh state, it is practically odorless. Odors play an important role in communicating with the Supernaturals who accept as pleasing only the smell of tobacco smoke and that of carana (*Protium heptaphyllum*). Both types of sago available to the Warao fulfill this condition, but, besides relative abundance, *Mauritia* outdoes *Manicaria* on one other important score – it is colorless. When fresh, *Mauritia* sago is as white as plaster of Paris; whereas *Manicaria* starch is beige to light brown. White is the color of predilection of the directional world gods who supposedly feel much less attracted by the color of *Manicaria* starch, which turns a dark brown several days after production.

The color makes it much more appropriate for the *Manicaria* to serve a secondary god, that of the dark Underworld. This spirit is known as *Kanishabarao* and is believed to dwell below the earth in company with his people, right next to the abode of *Ya ahuba*, the Temiche Master Snake.

All palms, major trees, and most animals depend for their existence upon a master snake. The snake of *Manicaria* is a night spirit, appearing on earth only around midnight, when it comes to move softly the beautiful leaves of the palm. Thus, *Manicaria* pertains to the midnight sun as *Mauritia* belongs to the gods of the zenith and the world mountains at the cardinal and intercardinal points of the universe (Wilbert 1973).

This aspect recalls the day and/or night association of palms in other cultures. As Schultes (1974:7) pointed out, similar beliefs prevail among the Kuripako of Colombia in connection with *Leopoldinia Piassaba*. Fiber gatherers "are often bitten by poisonous snakes that infest the thick clumps

of hanging fiber — a danger that probably underlies in part the natives' belief that the evil spirit, the *curupira*, inhabits *piassaba* groves and wanders around at night." The same *curupira*, we should add, is the central Master-of-Animals figure in South America who functions as the patron spirit of the trees and the forest (Zerries 1954: 18). *Kanishabarao* of the Warao is obviously a cousin of the Amazonian *curupira.* Furthermore, there exists also a sun-palm relationship among the Yukuna Indians of Colombia, whose *kai-ya-tee* festival resembles the annual sago festival, *nahanamu*, of the Warao, and "basically celebrates the harvest of the *pupunha* palm which was given to the Yukuna people by the 'Sister of the Sun' as one of their major cultivated foods" (Schultes 1974: 16).

That the *Manicaria* belongs to the midnight sun rather than to the day sun becomes apparent in the belief that, while its sago may be unsuitable for a *nahanmu* festival in honor of the cardinal gods, it is, nevertheless, used for this purpose by *Kanishabarao* and his people of the underworld. Annually they prepare a feast of *temiche* sago, and that is why the Indians may come across hollowed-out trunks of the palm in the forest. *Kanishabarao* and his people also eat the nuts and all the parts of the palm that humans enjoy.

Finally, *Manicaria* sago is believed to be extracted by the monkey (*naku*) for purposes of celebrating an animal *nahanamu* palm festival. Monkeys are supposedly very fond of the starch and are believed to be yet other "people" that hollow out the palms one happens across in the forest. Instead of fish or crab, monkeys are said to prefer large spiders (*abunamoko*) with their starch.

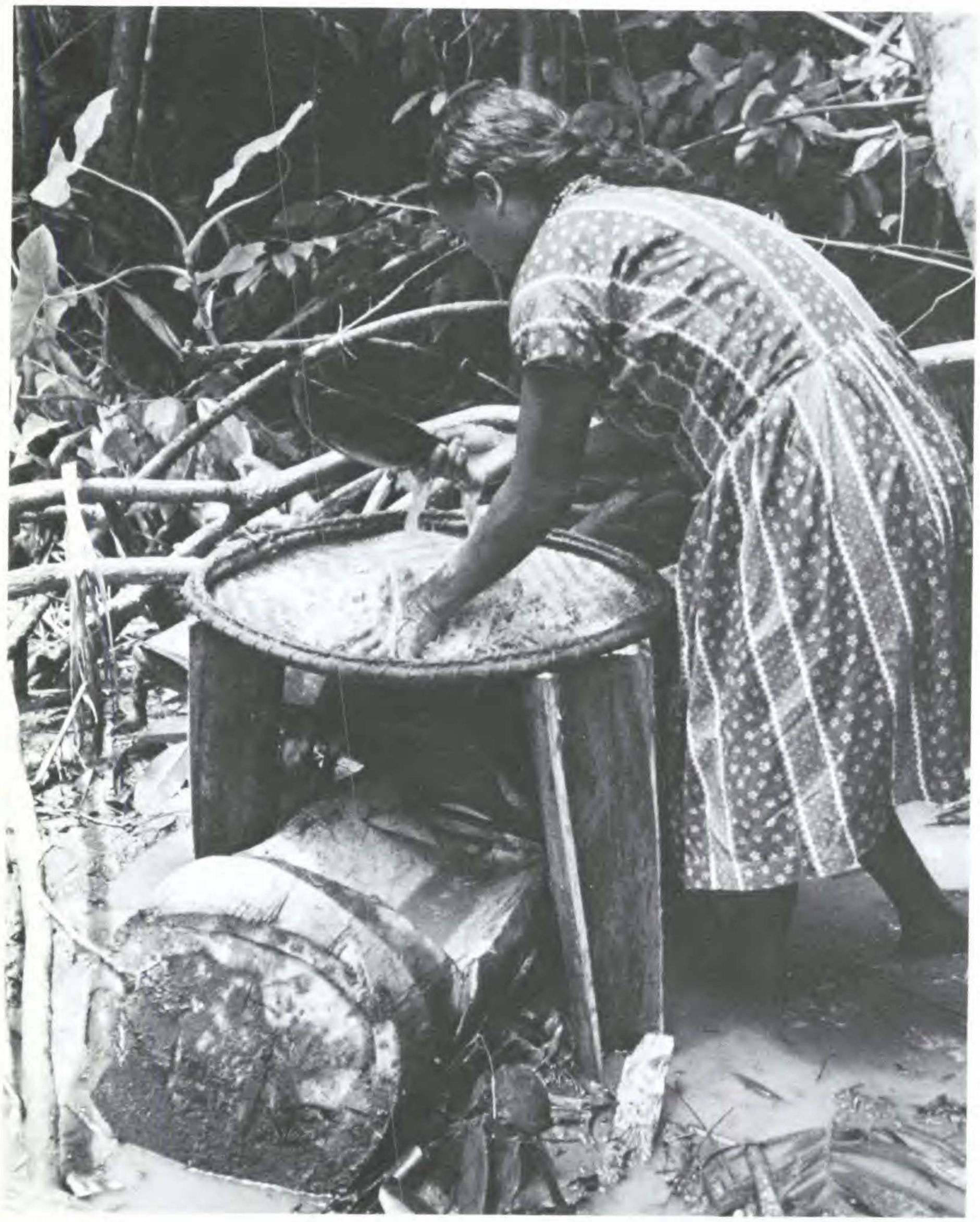
The custom of recovering palm starch from *Manicaria* is essentially a feature of the past with the Warao. It came to my attention when an elderly informant remembered hearing his uncle and other elders send workers out to prepare *Manicaria* sago. It was done occasionally, he said, when the people were away from the *Mauritia* groves fishing on a major river. To supplement their diet, they relied on *Manicaria* sago which was always close at hand in the Intermediate

Plate XCIII

Beginning the process of washing starch out of the shredded pith of the *Manicaria saccifera*. Highly contaminated water is taken directly from the swamp.

Photograph by Johannes Wilbert

Plate XCIV



Woman kneading the pith with both hands.
Photograph by Johannes Wilbert

After the starch has settled down at the bottom of the V-shaped trough the woman starts ladling out the water. *Photograph by* JOHANNES WILBERT

Plate XCVI

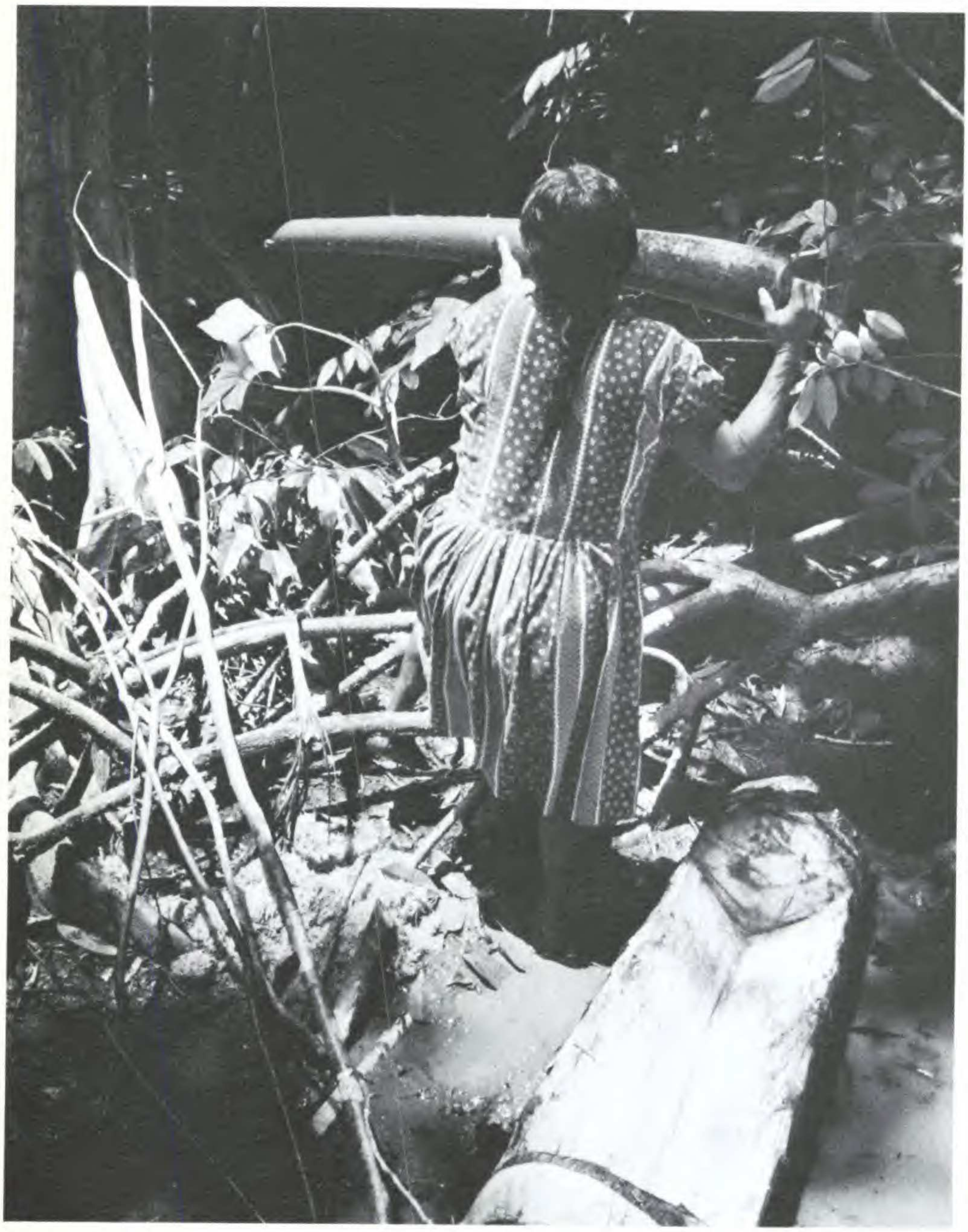
Starch is scooped with hands from the bottom of the trough into a calabash. *Photograph by* Johannes Wilbert

Plate XCVII

After processing the pith woman washes the strainer very carefully to avoid rotting of the basketry material.

Photograph by Johannes Wilbert

Plate XCVIII



Woman dismantles the washing stand after extracting enough starch.
Photograph by Johannes Wilbert

zone of the Delta. The wife of my informant, who comes from a different region than her husband, said she also distinctly remembered having seen people collect and eat *temiche* starch. Those who still know about it are in their fifties and older. The younger people in the village had never seen or even heard about it.

One need not invoke prophetic insight to predict the disappearance, in the near future, of palm-starch production from all of South America. The majority of southern tribes referred to in the introduction have already either given it up or are so reduced in number that the practice of starch recovery will soon come to an end. Among the Warao, even *Mauritia* extraction is declining rapidly and will soon become a rarity. Yet, in South America, as elsewhere, recovery of starch from different genera of palms represents the survival of a once more common tradition that reaches back into the remote, prehistoric past. It survived the Neo-Indian revolution of subsistence agriculture only among a small number of marginal tribes, but it is giving way increasingly to agricultural staples even among them. In any event, for the Warao this form of traditional aboriculture provided a measure of economic stability not unlike that achieved by other indigenous societies through agriculture. The entire man-palm relationship as it developed among these people over many centuries can be fully understood only in the context of *Manicaria*, *Mauritia*, and *Euterpe* ethnobotany. Realizing this and going a little beyond the scope and evidence of the present paper, may I suggest in concluding that economic stability is not the only benefit that the Indians have derived from gathering around these regal plants. As their ethnobotanical lore reveals, the palms have nurtured among the Warao an exquisite partnership between man and nature — a symbiosis that, in addition to a viable socio-economic blueprint, generated an ideological matrix that gave meaning to the world and purpose to life. Surely, achievements of this sort must rank among the finest that mankind has made anywhere.

ENDNOTES

1. Cf. Lévi-Strauss 1950: 469–472; Fuerst 1970: 114–122.
2. The only previous mention that I could find was Barral (1949: 150), who said: "Pero el "*aru*" propiamente tal, el "*aru*" guaraúno [Warao], es la torta hecha con la fécula extraida de la "Mauritia flexuosa", o también del temiche (Phitalephas temiche), no tan ponderada como la de moriche, pero tan real."
3. Among the secondary palms, the authors (ibid., 116) list: *Acrocomia*, *Caryota*, *Coelococcus*, *Corphyra*, *Eugeissona*, *Phoenix*, and *Pholidocarpus*.
4. I am using the so called ethnographic present, although the practice of palm-starch production may very well have been discontinued now among some of the tribes of southeastern South America.
5. Gumilla 1791, 1: 145; Schomburgk 1848: 49; Turrado Moreno 1945: 73–83; Suárez 1966; Wilbert 1972: 81–82; Heinen and Ruddle 1974.
6. Cf. Dahlgren 1936: 202 and references since then (1936): Bailey 1943: 392–393 Dugand 1940: 43; McCurrach 1960: 129–131; Wessels Boer 1965*a*, *b;* Braun 1968: 111.
7. If it is any consolation to botanists, *Manicaria* is ethnobotanically all but unknown; the snatches of information, frequently repeated, are restricted largely to the usefulness of the leaves for thatch and of the spathe for "monkey-caps." In estimating migration and settlement patterns, for instance, archaeologists and ethnologists may have underestimated the effect of palm exploitation on the relative stability of autochthonous peoples in South America and elsewhere. I would like to thank Mr. August Braun and Drs. Harold E. Moore, Jr., Richard Evans Schultes, and Julian A. Steyermark for advice and assistance with the botanical aspects of this paper.
8. Von Spix and von Martius (1823–1831: 3, 989) observed the same custom practiced on Marajó Island in the mouth of the Amazon.
9. Lat. *manica* = sleeve; *saccifera* = sack-bearing.
10. The ratio of single to multilobed fruits seems to vary markedly. In a second sample examined, I counted a total of 72 fruits with 42 one-seeded, 27 two-seeded, and three 3-seeded ones.
11. The apical incision in *Manicaria* eophylls results in two opposite terminal leaflets, each segment with an acute apex and smooth margins.
12. The hoe and all the other tools and techniques employed in the recovery of *Manicaria* starch are the same ones that the Warao use for the extraction of sago from *Mauritia*.

13. I am taking the Indians' word for the fact that *Manicaria* has no annual flowering period and that the palm carries starch the year round. If incorrect, the result of a single test ought not to be generalized, since it is known that the starch content in *Mauritia* of the Orinoco Delta, for instance, may vary seasonally from 2 kg. to 60 kg. per palm (Heinen and Ruddle 1974: 122).

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